

# interface...

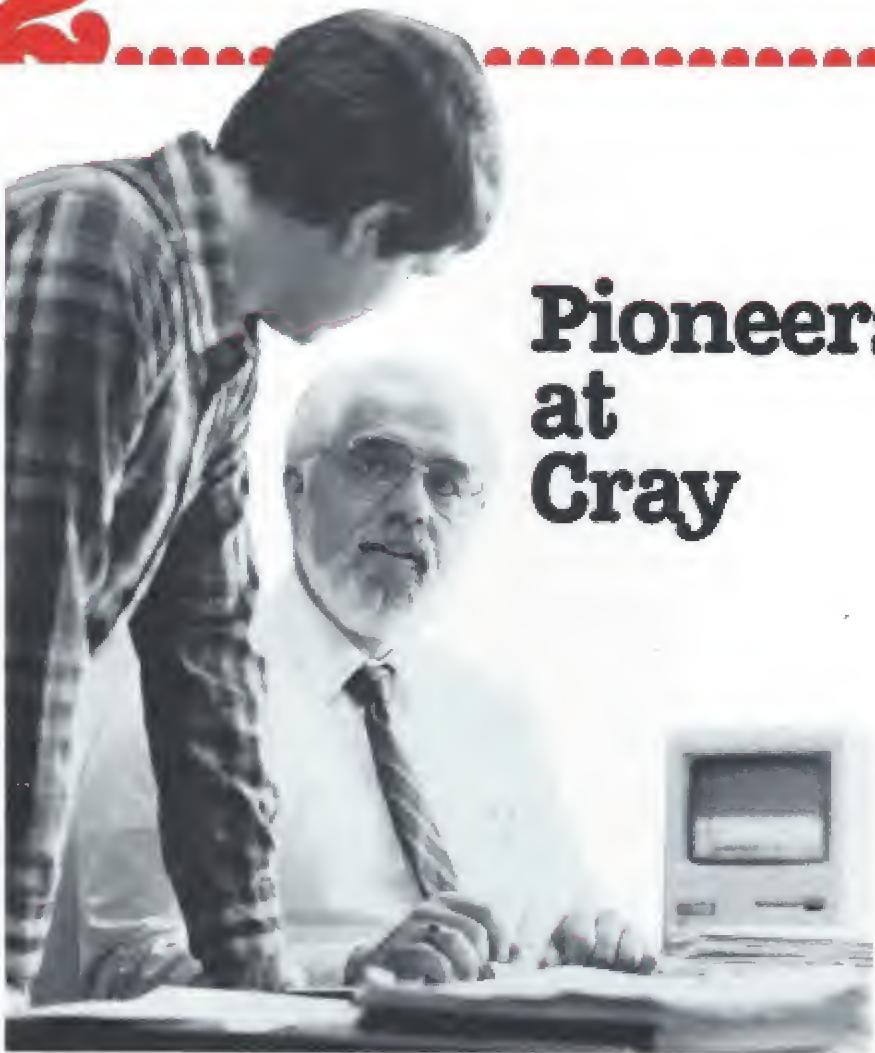
A Cray Research, Inc. publication

March, 1987

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*The first CRAY-1 and CRAY-2 computers were prototype products. Today, those prototypes have become stories of success.*



*Jeff Evanko and Howard Watts help Cray Research maintain a leading-edge reputation at Magnetic Fusion Energy Computer Center. Cray's reputation started with the first CRAY-1 computer and was reinforced with introduction of the CRAY-2 system.*

Which would you rather do: explore a dark, unfamiliar cave where no person has gone before, or climb Mt. Everest after hearing the challenges faced by those who made the climb before you?

In 1976, a small group of people from Cray Research chose to probe the cave when they designed and delivered the first CRAY-1 computer to Los Alamos National Laboratory (LANL). Nine years later, another group of employees from Cray Research, some of whom had experienced the success of the first exploration, started up the mountain with the first CRAY-2 computers. They knew that with extreme effort they could reach their goal. At the same time, they were fully aware of the challenges that lie ahead — challenges born of

a strong company reputation and high expectations.

As with any prototype product, both the CRAY-1 and the CRAY-2 systems challenged the people who worked with them. However, the people working with CRAY-2 systems today face an additional challenge — high customer expectations.

"The delivery of the first Cray computer system provided a whole new realm of possibilities for the world of advanced scientific computing," comments Jeff Evanko, engineer-in-charge (EIC) at the National Magnetic Fusion Energy Computer Center. "The people who made that system work conquered a new territory and established a reputation for Cray Research. In the same light, the first CRAY-2 system provided supercomputing power in

an entirely new dimension — new size, new speeds — another new territory. It was up to everyone who worked with those first few CRAY-2 systems to uphold the reputation of Cray Research and to meet existing customer expectations."

### **Expectation versus reality**

When the CRAY-1 computer came into existence, it provided new capabilities for the scientific world. Several obstacles had to be met, however, before those capabilities could be recognized. For example, software had to be developed before the machine could be fully useful. "The machine was, in all respects and to everyone involved, a prototype," says Dick Morris, vice president of technical operations and one of the engineers who delivered the first CRAY-1 system. "Neither Cray Research nor LANL really knew what to expect. We all knew the potential was there, but could we make it work?"

Along with the CRAY-2 system came similar questions and challenges, but customer expectations were higher. LANL took a chance with the CRAY-1 system — it was the first product of a start-up company. The first customers of the CRAY-2 systems, Magnetic Fusion Energy Computer Center at Lawrence Livermore National Laboratory, NASA-Ames, and the University of Minnesota Supercomputing Center, were already Cray customers when they ordered their CRAY-2 systems. Their expectations were based on the company's existing product lines. Even though they knew that the CRAY-2 system was introducing a new technology, their expectations for performance were high.

"The first customers to receive CRAY-2 systems were aware of our standards for mean-time-to-interrupt, data transfer rates, and overall system performance," explains John Greene, EIC at NASA-Ames. "In other words, a company who delivers state-of-the-art for the better part of nine years

should know what it's doing. This pressure for performance made the jobs of people working with the first CRAY-2 systems very challenging."

The people involved with both projects — the original CRAY-1 and CRAY-2 computer systems — made significant personal investments into those systems. With the CRAY-1 computer, failure would have meant the company's dissolution. With the CRAY-2 computer, if the idea didn't work, the company's reputation would sink. "Working on the leading edge of technology is a prestige item," explains Mike Feuerstein, district field engineering manager in Sunnyvale, California. "But along with that prestige comes a lot of incredibly hard work — it requires a lot of motivation and dedication. Those people who rose to the occasion in 1976 got this company rolling. In 1985, they improved the company's already outstanding reputation."



*The first CRAY-1 and the CRAY-2 systems presented similar challenges. But as Mike Feuerstein and John Greene at NASA-Ames explain, the challenges today are compounded by high customer expectations.*

### **The challenges of a new technology**

Continued enhancements to the basic architecture of the CRAY-1 product brought about the CRAY X-MP system, which used similar yet more advanced technologies. Continuing with its mission to produce the most powerful computer systems, Cray Research then developed the CRAY-2 system. This system, however, was an entirely new product. It was a new technology that required a great deal of innovation to get it off the ground — and to keep it there.

The installation of the CRAY-2 system gave way to some real and constant challenges — challenges that no one had ever seen before because there was nothing in existence for comparison. "Although the rate at which software became available for the CRAY-2 system was much faster than with the CRAY-1 system," explains Jim Allshouse,

EIC at the University of Minnesota, "testing was extremely difficult on the CRAY-2 system. In fact, at first we didn't know about the codes that would make the machine fail. But now, as with the first CRAY-1 system and its followers, quite a bit more software is available. Because of the hard work and dedication of everyone involved on the CRAY-2 project, we now have a significant collection of jobs to exercise on the new machines."

The development of the CRAY-2 system gave several people the opportunity to experience what only a handful were able to enjoy in 1976. "There was support throughout the company," says Jerry Brost, director of CRAY-2 development, who was another key player in the delivery of the first CRAY-1 system. "But even so, the CRAY-2 system was so unlike anything ever done before that there wasn't a whole lot of advice anyone could give. It was true pathfinding for everyone involved."

Cray Research began on the leading edge of technology and has remained there because of the people who invest their talents into this company. With both systems, the first CRAY-1 and the first CRAY-2, there were numerous challenges based on the unknown. Because of the efforts of everyone involved those challenges were met, and the result was success. ●



A number of people who played a part in the development, manufacturing, installation, and maintenance of the first CRAY-1 system are still with Cray Research today. Here are some reflections from those people on Cray Research — yesterday and today.



**Al Sterling**  
1976 — Field Programmer  
Today — Senior Program Analyst

"I was the first person at Cray Research to be hired as a diagnostic programmer," remembers Al. "With the exception one or two programs written in CAL, my job was to translate diagnostic tests from octal into a CAL source. We weren't sure of all the details, but what we did know was that the CRAY-1 system was going to amaze the entire computing world."

"It was just a matter of bringing the system up and getting that power out to customers. I don't think that any of us at that time had any idea of this company's capability. We were looking at a market of 70 or 80 potential sites, and at the end of 1986, we had almost 150 systems throughout the world. We've gone beyond what anyone expected or even imagined."

# Where are they today?



**Dave Schulist**  
1976 — Electronic Technician  
Today — International Technical Support for the CRAY-2 system

"Although they are entirely different in terms of hardware," explains Dave, "the CRAY-1 and CRAY-2 prototypes had a lot of similarities. First, they both had to be initiated into the real world. When the systems were delivered, neither had been tested in a true work environment. And you really don't realize how to formulate valid field maintenance procedures until you have a machine out in the field. Every machine varies slightly. Only when you are actually working with it can you decide which trouble-shooting maintenance procedures will be most effective."

"There is a lot of work that goes into the maintenance of a prototype machine. I think in both cases, we had to prove not only the reliability and maintenance of the actual circuitry, but also the mechanical aspects of the processors. Beyond that, we had to prove ourselves as a company. Needless to say, we've reached both of those goals."



**Jerry Brost**  
1976 — Engineer  
Today — Director of CRAY-2 System Development

"What was our goal in 1976?" Jerry remembers: "It was to make Serial 1 work. When we delivered the system, everyone knew that we didn't have the software to make it run. We had to start little by little to exercise the machine as software was developed and hardware problems were solved."

"We ran into a similar challenge with the first CRAY-2 system at MFE. With that first system, we didn't have all the software, nor did we have full testing processes available. Put simply, we couldn't test for all the ways a machine could fail. But like Serial 1, we met the challenges one step at a time, and today on any CRAY-2 system we deliver, we run the operating system with user codes for 100 hours with no interrupts."

"In both cases, there have been challenges and fun. One thing that I've learned is that you truly have to deliver a system with a whole lot of optimism. If I'd known then about the potential challenges involved, I would have been a lot more scared. The point is, at Cray Research, we don't think that way. If there's a will, there's a way. And we find it."



**Dave Judd**  
1976 — Programmer/Analyst  
Today — Manager of CRAY-2 Software Development

"Looking back at the days of the first Cray-1 system," recalls Dave, "what stands out in my mind is the availability of equipment. At that time, we did all of our software development for the CRAY-1 system on a general simulator. On this piece of equipment, which is extremely slow by today's standards, we faced the challenge of getting enough software to demonstrate the performance of the machine. Essentially, we were faced with survival."

"Making those basic functions available with such a small group was a challenge in itself. But as a result of that effort, we have a large base of software that runs on our computer systems today. As manager of CRAY-2 software development, however, I have seen some repetitions in Cray's history. As with the first CRAY-1 system, the software needed to effectively run the first CRAY-2 system just was not available. And at the same time, we were faced with an additional challenge: our customers now had expectations that had been defined through previous success."

"Which situation did I prefer? That's hard to answer because both were unique pioneering experiences with their own challenges. I'm glad I've had the opportunity to experience both."



**Dick Morris**  
1976 — Director of Customer Engineering  
Today — Vice President of Technical Operations

"During our six-month trial at Los Alamos," remembers Dick, "we barely ran four hours without an interruption. Today, if we ran less than 100 hours, there would be a great deal of concern. We also had no operating system in 1976. Today, if we don't show up with working software, people have a problem. Our customers already have workloads ready to go before the installation team leaves Chippewa Falls."

"In 1976, both Cray Research and Los Alamos merely *hoped* that we would succeed. When we pioneered the first CRAY-2 system at the National Magnetic Fusion Energy Computer Center, that hope was the same, but customer expectations were much higher. We were *expected* to succeed. These expectations, which are a tremendous challenge to today's field engineers and analysts, are also part of our company's reputation. They fuel the market, helping us sell our computer systems to current and new customers. It's each employee's job — just as it was for the original group in 1976 — to meet customer expectations, and to continue to meet them as they develop."



**Dick Nelson**  
1976 — Support Analyst  
Today — Software Specialist

"The first CRAY-1 system was a mutual learning experience for Cray Research and Los Alamos National Laboratory (LANL)," remembers Dick. "The machine was as much an experiment for them as it was for us."

"When the system was delivered, it went without the software basics. The challenge my small group and I faced was to develop an assembler, loader, and a Fortran compiler. In addition, we wanted to implement vector capabilities with Cray's first compiler, CFT, as soon as possible."

"The difference is that in 1976, the goals were very simple and easy to define. We both knew what was needed; it was only a matter of time and a lot of hard work."

"Today, I do a lot of experimentation, development, and code improvements for CFT on the CRAY-2 system. Our software has come a long way since 1976. It is much more sophisticated. At the same time, there are similarities between now and then — we're still learning, experimenting, and trying to improve."

## Education for the future

The *American Heritage Dictionary* defines automation as: "The mechanical and electronic techniques used to achieve automatic operation and control." In other words, automation is not entirely independent of the human touch — it must be initiated and maintained.

This need for human involvement has an impact on the activities in Chippewa Falls's manufacturing operations. Last January, a task force, which included representatives from divisions throughout Chippewa Falls, came together to discuss changing roles in manufacturing.

After diagnosing the needs of future projects, the challenge was obvious: manufacturing needed automation preparation. The result was a pilot program coordinated with District One Technical Institute in Chippewa Falls to provide automation technology training to a select number of employees from Cray Research.

As Don Whiting, vice president of manufacturing explains, "It's an exciting opportunity for employees to learn new skills that can be applied to Cray processes. When these people finish the automation technology education program, they will be able to apply their background in electronics to operate and maintain the robotic lines that are moving into the manufacturing process."

Because of the intense time and energy commitment demanded by this one-year program, the selection process was very involved. To begin, the educational opportunity was available to anyone in manufacturing or a CRAY-3 group who was in production grades of P1, P2, or P3, or hardware grades of H2 or H3. From there, interested employees completed an application and a self-evaluation, and took an



*There is a strong commitment at Cray Research to train employees for the future needs of the company.*

aptitude test. Selection was based on these items along with a review of job performance.

Currently, there are 14 Cray people in the pilot program that started in January. In addition to having all instructional costs paid by Cray Research, these people are considered to be full-time employees; they receive full pay and benefits while attending school.

"The intent of the program," says Marc Harding, human resources manager in Chippewa Falls, "is to prepare for the automation technology that is just around the corner. We're doing this by training a group of people to operate and maintain our robotic lines."

Although automation already exists within smaller subgroups, the actual introduction of robots into Cray's manufacturing operation took place last November. The most notable robot, *Ralph Norton*, currently works in modules. He helps assemble modules by placing chips into boards on an automated basis. He is currently doing 25 percent of all component insertion. "As our products evolve, we're getting smaller and smaller parts to work with," explains Steve Hughes, manufacturing engineering supervisor. "We've reached the point where it's difficult to manufacture our parts by hand while continuing to have the quality and reliability

we want in our systems. Automation is the answer to this challenge."

In the case of *Ralph Norton*, the advantages are numerous. "The chance of component misinsertion is decreased," Steve continues. "Control of electro-static discharge (ESD) is increased, and the entire production process is much more versatile because of the robot's margin of flexibility."

With today's movement toward automation, the need for people with technological experience in electronics is as real at Cray Research as anywhere else. One answer is the Automation Technology Education Program.

There is a strong commitment within this group of students to meet this need for the company and to help themselves prepare for their futures. As Brenda Boyea, one of the 14 people involved in the program, explains: "Manufacturing techniques are rapidly becoming more sophisticated, but if you are interested in upgrading your skills in pace with this change, Cray Research gives you the chance — whether through this program or any of the other educational opportunities at this company. If you are truly dedicated to your future and the future of Cray Research, the opportunity exists for you."

Automation Technology Education is a training program offered to

address future needs as automation moves into the manufacturing process. It is, however, only one example of Cray's commitment to retraining and preparing for the future.

"Cray has a tuition reimbursement program that opens the door to further education for every employee," explains Julie Marlette, manager of employee development in Chippewa Falls. "In-house video programs such as the Interactive Video Electronics course in Chippewa Falls and Rice Lake also are available. The new UNITE program in Chippewa Falls and Mendota Heights is another educational opportunity, as are any of the internal development programs offered through human resources. All of these programs provide employees with the opportunity to learn new skills and develop themselves to be future contributors at Cray Research."

Cray's training programs, however, extend well beyond these opportunities. "The entire program is very dynamic," Julie continues. "We are constantly looking for new educational opportunities, and the Automation Technology Education program is a good example of this. Essentially, through the different training opportunities, Cray Research is building a partnership with the employees — one that will take us both successfully into the future." •

### Automation Technology Students

- Harold Anderson
- Barbara Arendt
- Brenda Boyea
- Karen Chance
- Randy Duss
- Brenda Gottfredsen
- Lester Johnson
- Dawn Kuehn
- Karen Olzewski
- Mary Shilts
- Lori Sonnentag
- Sandra Stuckert
- Cindy Traynor
- Patricia Yeschek

## Investment with a good return



*Because of Cray's commitment to research and development, the company is now an industry standard in the world of high-performance computing.*

Not long ago, when a Japanese consortium announced a five-year, \$100 million budget for research and development of advanced computer systems, Americans were shocked — many were alarmed. People wondered whether American businesses could compete with Japan's effort. What they didn't know is that by the end of 1986, Cray Research would surpass the planned Japanese expenditure by a factor of two.

In fewer than fifteen years, Cray Research has dedicated more than \$265 million to research and development. And in 1987 alone, the company expects to spend another \$100 million for research and development.

Cray's commitment has paid off. In 1976, the company delivered the first CRAY-1 computer system. In 1982, the CRAY X-MP product was announced. And two years later, in 1984, the CRAY X-MP/4 and CRAY X-MP/1 models were introduced. In 1985, the CRAY-2 system hit the market. And in 1986, the company announced expansions to the CRAY X-MP product line and reduced prices.

The company's most recent announcement, on February 10,

continued this tradition and demonstrated the results of its research and development investment in two of five development areas — the CRAY-2 and the CRAY X-MP product lines. In addition to two new models of the CRAY-2 system and another two models of the CRAY X-MP product line, the company announced a new high-speed external channel (HSX) for both lines of computer systems and numerous price/performance improvements.

As in past years, the company is dedicated to investing fifteen percent of revenue in research and development — an investment that is among the highest in the industry.

For the past fifteen years, the company's research and development programs have helped the company become an industry standard in high-performance computing. Cray's continued financial commitment, together with the dedication and commitment of people throughout the company, are demonstrating strong returns. This commitment to research and development is helping ensure that the company's reputation for leadership is preserved. •

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# BenefitsPlus

The February issue of *Interface* introduced you to a monthly benefits column. This month, we would like to present the official name and logo of this column: **BenefitsPlus**.

Created by Corporate Communication's graphics group, this logo is designed to represent Cray's benefits package, which is highly competitive with benefits packages offered by other companies in the industry. The **Plus** depicts the flexibility in our program — a combination of basic benefits, plus optional choices.

This new logo will appear on all benefits communication materials in the future.

## **Changes in HCEA reimbursement procedures**

Effective April 1, 1987, the rules for submitting expenses and receiving reimbursements from the Health Care Expense Account (HCEA) plan will change. The Dependent Care Expense Account (DCEA) plan also begins at that time, and the new rules will apply to both plans as follows:

- Reimbursements will change from one per month to a scheduled biweekly basis.
- Beginning Friday, April 3, reimbursements will be issued on the Friday dates opposite the biweekly paydays. (e.g., March 27 is a biweekly payday and reimbursements will be made on the next Friday, April 3, and then again on April 17.)
- The minimum reimbursement of \$45 may be a combination of HCEA and DCEA expenses. Expenses will be paid only from the applicable account.

- If expenses exceed the current account balance(s), the excess expense will be "pended" and reimbursed when both the pending expense and the account balance equal at least the \$45 minimum.
- Pending amounts of less than \$45 will be issued only during the January 1—March 31 grace period for submitting expenses at year-end.
- Beginning April 1, revised reimbursement request forms for claiming both HCEA and DCEA expenses are available from your local human resources representative. When your expenses are processed, you will receive one explanation of benefits (EOB) that will identify the expenses from each plan. Quarterly account statements also will identify the status of each account individually.

## **HCEA forfeitures for 1986**

Be sure to review your December 31, 1986 quarterly HCEA statements to determine your present account balance. If you do not have eligible expenses, or if you do not submit eligible expenses to Prudential by March 31, 1987, account balances will be forfeited to Cray Research. These forfeiture rules are based on tax code and IRS regulations.

## **IRAs**

The 1986 tax year will be the last year for which many individuals will be able to receive a tax deduction for contributions to an Individual Retirement Account (IRA). Eligibility for the tax deduction changed under the recently enacted Tax Reform Act, effective with the 1987 tax year. Therefore,

here is a reminder concerning a 1986 tax year IRA contribution:

- April 15, 1987 is the last day to open or contribute to an IRA for the 1986 tax year.
- Any such contribution must be designated as a 1986 contribution.
- Contributions to an IRA for 1986 can mean significant income tax savings because up to \$2,000 (\$2,250 for a married couple with a non-working spouse), is tax deductible and earnings are tax deferred.

If you wish to open an IRA, you should investigate the plans offered at various financial institutions. The plans differ in fees, investment options, and in other ways.

Beginning with the 1987 tax year, individuals who are active participants in an employer's pension plan (such as Cray's Deferred Profit Sharing and Investment Savings Plan) will be limited as to the amount of tax deduction they may receive, if any, for contributions to an IRA. Tax deductions for pension plan participants are now based on earned income levels. (Refer to the tax table.)

A "participant" is an employee who has met the pension plan's eligibility criteria and reached his or her entry date into the plan. For example, in Cray's plan, you become eligible after six months of employment with 500 hours of service. You become an actual plan

participant on the first day of the next month (your plan entry date). You then are eligible for a share of the company's annual cash and deferred profit-sharing contribution (and the matching funds for investment savings contributions if you enroll in that portion of the plan).

Although the availability of a tax deduction for IRA contributions becomes limited in the 1987 tax year, contributions up to \$2,000 (\$2,250 for a married couple with a non-working spouse), would continue to be eligible for tax deferral of the earnings. So an IRA may still be a valuable option for individuals who lose part or all of the tax deduction. For further information, you should consult your tax or investment advisor.

### **IRA Limitation**

(Beginning 1987 Tax Year)

#### **Adjusted gross income by filing status**

#### **Allowable deduction\***

#### **Not an active participant in a qualified plan**

#### **Active participant in a qualified plan**

#### **Married Filing Jointly**

\$0-\$40,000

\$2,000

\$2,000

\$40,000-\$50,000

\$2,000

Phase-out (\$0-\$2,000)

Over \$50,000

\$2,000

\$0

#### **Single**

\$0-\$25,000

\$2,000

\$2,000

\$25,000-\$35,000

\$2,000

Phase-out (\$0-\$2,000)

Over \$35,000

\$2,000

\$0

\*Amounts stated at \$2,000 are for individuals. The allowable deduction is \$2,250 for a married couple with a non-working spouse.

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## News Briefs

### French government agency orders system

On February 23, Cray Research announced that the Commissariat à l'Energie Atomique (CEA), has ordered a CRAY X-MP/416 computer system valued at approximately \$18.5 million. The purchased system will be installed in the second quarter of 1987 at CEA's computer facility in Limeil, France, pending export license approval.

The CRAY X-MP/416 computer system, which will be CEA's third Cray supercomputer, will be used for scientific research.



FRANCE

### Aerospace corporation installs system

On March 3, Cray Research announced that Grumman Aerospace Corporation installed a CRAY X-MP/14 supercomputer with Solid-state Storage Device valued at

approximately \$8 million. The system was installed in the first quarter of 1987 at Grumman's scientific computer facility in Bethpage, New York.

The new system replaces a CRAY-1/M computer system installed in 1983 and will be used for engineering and scientific applications needed in the design of complex aircraft systems. These applications include computational fluid dynamics, structural analysis, image processing, and aircraft mission analysis.

### New Central Region General Manager

On February 2, 1987, the advisory board of the Central Region announced the appointment of Jim Merrell as Central Region General Manager.

Jim has been sales manager for the region since joining the company in October 1985. Before that, he had been with IBM in various sales and marketing positions.

The members of the Central Region management team that now report to Jim are: Sonya Anderson, analyst manager; Bob Biro, director of administration; Laura Wallace, human resources manager; and Steve White, field engineering manager. The region, with 160 people, covers 14 midwestern states and will continue to be headquartered in Boulder, Colorado.

### Cray purchases Eagan property

Late last year, Cray Research purchased a parcel of land in northeastern Eagan, Minnesota. The purchase consists of 116 acres of commercially-zoned property that lies east of Minnesota Highway 55 and north of Lone Oak Road.

"This purchase provides us with company-owned property for future

growth," notes John Carlson, executive vice president of finance. "We are currently preparing plans for construction of a new computer center on the site."

### What do these numbers mean?

The CRAY X-MP/416 computer system, the CRAY X-MP/12 computer system — have you ever wondered what the numbers following the system name mean? Here's a quick explanation using the CRAY X-MP/416 as an example.

The number immediately following the slash mark indicates the number of central processing units (CPUs) in the system. The next number, or group of numbers, gives the memory size of the system in millions of words. In the case of the CRAY X-MP/416 system, there are four CPUs and 16 million words of memory.

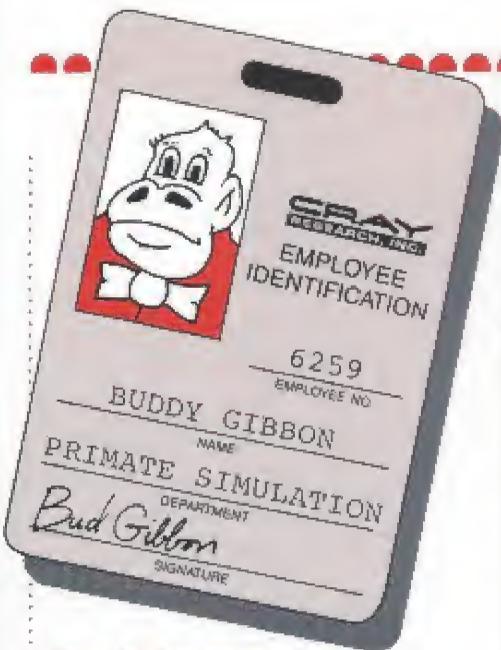
With that explanation, you can see that the CRAY X-MP/12 has a single processor with two million words of memory, and the CRAY X-MP/48 has four CPUs and eight million words of memory.

### 1986 in review

The annual report will be available for distribution at the end of March. Because so many of Cray's employees are shareholders and will be receiving copies at home, a general employee distribution is not planned.

The report will be available, however, to anyone who would like a copy. Please contact the Distribution Center in Mendota Heights if you are interested.

1986



### Don't leave home without it

If you forgot your identification badge, don't try to get past security guards. They've already seen the pass with a monkey's picture pasted on it. They've already heard the one about the hungry dog, and the one about how you dropped it in the mail with the electric bill. They've heard all the excuses in the book, and they simply can't let you in without a badge.

At Cray Research, security is essential to the conduct and success of our business. Complying with regulations is mandatory for our own security, and beyond that, it is demanded by some of our contracts.

Even though some of Cray's security guards will be celebrating their fifteen-year anniversaries along with the company's, they can't be expected to recognize everyone, particularly when appearances constantly change. If you left your badge at home or in your car and don't want to go back for it, you don't need the excuses and humor. One-day temporary passes are available.

Showing a badge is not an unnecessary delay. It stresses the value of our admittance identification. So if your badge gets carried off by a bird or goes out with the morning trash, get a temporary pass, and apply for a new badge as soon as possible.

### More growth for technical training

Both the hardware and software training departments experienced significant growth during 1986.

The hardware training department reported that 1,102 people were trained in Chippewa Falls during 1986, compared with 512 people during 1985. This is a growth rate of 115 percent.

The numbers for software training were 1,722 people trained during 1986 and 1,150 in 1985, which is a growth rate of 50 percent.

Additionally, 532 people received on-site training in 1986 compared to 159 people in 1985 — a 230 percent increase in just one year.

Congratulations are in order for a job well done.

### Logistics department moves

The logistics department in Chippewa Falls moved to its new facility during the first week of March. The new building, named Technical Operations Logistics, is located just off of Highway 53, north of Shopko Plaza; it was formerly the home of Manor Interiors Inc.\*

The 15,000-square-foot facility provides much needed space for the Logistics department, including offices, warehouse space, and a shipping and receiving area.

\*The new address is 6251 South Prairie View Road, Chippewa Falls, WI, 54729. The telephone number is (715) 723-3770.

### Critical news from Apple

The following SPR\* was received from one of the users at Apple Computer in Cupertino, California. It says much for our software development efforts on UNICOS. It also speaks highly of Cray's site analysts who provide strong operating system support to meet our customers' needs.

Date:	12/15/86
Product:	UNICOS
Version:	2.0
<b>Critical</b>	
Title:	UNICOS 2.0 Critically Close to Perfection

"The recent installation of UNICOS 2.0 at Apple is a major milestone in software development and support from Cray Research, Inc.

UNICOS was installed without any disruption to the user community while the builds ran. This isolation is greatly appreciated.

We booted it Monday, December 8, and made it available to our users for testing during production hours. The same system is still running, we have

never gone back to running the previous system. With the exception of some "telnet" terminal I/O problems, it is bug-free. Our regression tests show it fixed some known problems and caused no new ones.

Congratulations on a job very well done. UNICOS stability is fantastic!"

\*Abbreviation for software problem report



# 12.....

## Etcetera, Etcetera, Etcetera

### Time flies when . . .

On April 6th, Cray Research will celebrate its fifteen-year anniversary. Starting with ten people in 1972, the company has grown to more than 4,000 employees today. Cray Research has matured in many ways, yet some things haven't changed.

In addition to Seymour Cray, who has a special contract with Cray Research, seven people will celebrate their fifteen-year anniversaries with the company within the next year. It's true, time flies when you're having fun.

### 15-year Anniversaries

M. Dean Roush — May 1, '87

Les Davis — July 12, '87

Bob Allen — July 15, '87

John (Jack) Williams — July 15, '87

Edna Bunn — August 1, '87

Irv Engebretson — August 1, '87

Larry Gullickson — February 19, '88

### Fun facts for 15 years

Since Cray Research was formed in 1972, the company has:

- installed more than 150 Cray computer systems
- held the lead in the super-computer market base
- introduced Cray computing capabilities to more than 100 customers
- invested more than \$265 million in research and development
- made significant contributions to the advancement of multi-processing

- gone from one product (the CRAY-1 system) to two new product lines (the CRAY X-MP and CRAY-2 systems) that include twelve different models
- entered 13 new industry areas
- opened 12 subsidiaries
- had three stock splits: a five-for-two split in 1978, a three-for-one split in 1980, and a two-for-one split in 1985
- grown from ten employees to more than 4,000
- developed two major operating systems (COS and UNICOS), five compilers (CFT, CFT2, CFT77, Pascal, and C) along with numerous products, libraries, and stations
- worked with vendors to develop more than 400 application packages for Cray computers

### Congratulations Dan Kaschner

On January 19, 1987, Daniel Kaschner came to work as a programmer analyst for the Software Testing and Evaluation group in Mendota Heights. Like other people new to the company, he received his Cray identification card and employee number on his first day. Congratulations Dan, you are employee number 5,000!

Now the number 5,000 doesn't mean that Cray Research has 5,000 employees. As a matter of fact, at the end of January we had 3,636 domestic employees and 431 international employees. This brought us

to a grand total of 4,067 employees worldwide at the end of January.

There are several reasons why the numbers don't reflect our employment count. First of all, Cray's international employees have their own numbering system. Another consideration is that employee numbers are given to all employees — people who have left the company, and also to part-time employees, temporary employees, and interns. Finally, Cray's employee numbering system started with number 100.

"Everyone that started with Cray Research in January wanted to have the number 5,000," says Anita Regino, human resources representative in Minneapolis. "Is Dan eligible for an award?"

No Anita, there is no award. All Dan gets for his timely appearance is his name in print and an easy number to remember.

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